The National Space Grant Office requires two annual reports, the Annual Performance Data Report (APD – this document) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.

Wisconsin Space Grant Consortium
Lead Institution: Carthage College
Director: Dr. Kevin M. Crosby
Telephone Number: 262-551-6054
Consortium URL: spacegrant.carthage.edu

Grant Number: NNX14AP22H

PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Wisconsin Space Grant Consortium is a Designated Consortium funded at a level of $575,000 for fiscal year 2014.

PROGRAM GOALS

The mission of the WSGC is to use the excitement and vision of space and aerospace science to equip the citizens of Wisconsin with the math, science and technology tools they need to thrive in the 21st century.

Outcome 1: *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals (Educate and Employ):*

Goal A.1: To efficiently administer a competitive and highly visible program of fellowship and scholarship opportunities for college and university students in STEM disciplines that aligns with both NASA's mission and the missions of our affiliates.

Objectives

A.1.1: Deliver a competitive Scholarship and Fellowship program that is characterized by effectiveness at increasing retention in STEM fields among pre-college, first and second year students.

A.1.2: Increase the number of students from two-year colleges applying for and receiving WSGC scholarships and fellowships by at least 30% over three years to a combined pool of 5-10 applicants.

A.1.3: The WSGC will improve its longitudinal tracking efforts to support retention tracking among its F/S awardees.

Goal A.2: To increase the impact of the WSGC internship programs on career placements within the aerospace industry in Wisconsin.
Objectives
A.2.1: Cultivate partnerships with commercial partners within the state to offer at least 3 summer and semester internship programs.
A.2.2: Establish a pipeline for technically proficient STEM students at two-year affiliate institutions to transition from internship to career within the state aerospace industry.

Goal A.3: To expand opportunities for students to secure NASA Center internships and Co-Ops.
Objectives
A.3.1: Statewide, at least two students each year will receive NASA Center internships.

Goal A.4: To provide highly visible and impactful team-based research and space technology experiences for undergraduates.
Objectives
A.4.1: Ensure an efficient and equitable allocation of resources across existing and emerging team-based research and space technology opportunities for students.
A.4.2: Increase the diversity of students participating in high-impact team experiences to match the demographic profile of our affiliate campuses.

Goal A.5: To improve STEM education in institutions of higher education through the introduction of research-based pedagogies and learner-centric curricula.
Objectives
A.5.1: Provide at least one Higher Education Incentive awards to incentivize the adoption and adaptation of existing and proven curricular innovations in STEM education through a highly visible and competitive grant program for higher education faculty.

Goal A.6: To efficiently administer a competitive and highly visible program of research awards to faculty engaged in promising research related to NASA mission and goals.
Objectives
A.6.1: Support new and developing research in interdisciplinary and collaborative projects aligned with NASA's mission; annually support 1-2 such projects.
A.6.2: Expand opportunities (1-2 per year) for faculty-led student research programs at two-year schools through integration of our Research Infrastructure program with other WSGC programs for two-year schools.
A.6.3: Annually, support at least two research collaborations between faculty at affiliate institutions and between faculty and NASA Center scientists and engineers.

Outcome 2: *Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty (Educate and Engage):*
Goal B.1: To facilitate the development of K-12 instructional materials, outreach activities and informal education opportunities that promote the participation of a diverse population of students and faculty in STEM fields related to NASA mission and goals.

Objectives
B.1.1: Utilize our Aerospace Outreach Program to fund six innovative planning grants and supplemental grants for projects that increase interest, recruitment, experience and training of pre-college students in the pursuit of space- or aerospace-related science, design, or technology, or encourage K-12 students in space-related pursuits.

Outcome 3: *Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission (Engage and Inspire):*
Goal C.1: To incentivize the awareness and participation of underrepresented groups in NASA's mission through community-based programming.
Objectives
C.1.1: Utilize our Special Initiatives Program to fund at least five projects and programs that target historically underrepresented groups and that encourage their continued participation in WSGC programs.
C.1.2: Increase formal linkages between statewide K-12 institutions with underrepresented communities and space-focused informal education opportunities in the state.
C.1.3: Devote 10% of our K-12 funding programs to engage, inspire, and educate individuals with special needs to explore STEM-related curricula, programs, and careers.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1,2, & 3)

Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals (Educate and Engage)
The WSGC has traditionally focused on serving the vibrant network of smaller colleges and universities within the state. Our programs are aligned with, and responsive to, the needs of these affiliates. This focus entails cultivating aerospace and STEM interest in non-traditional students and in first-generation college students in both rural and urban settings. This year, 51 of our awards, representing 43% of our directly funded students, were from one of our non-research institutions. Christopher Christopherson, a non-traditional student at UW Oshkosh, provides an example of the impact of this approach. In 2014, through WSGC undergraduate scholarship and research award support, Mr. Christopherson undertook research that garnered a prestigious "Posters on the Hill" award through the Council on Undergraduate Research (CUR). With WSGC funding, Mr. Christopherson traveled to Capitol Hill to present his research poster *Observing Nebulosities: the Cygnus Superbubble* to members of Congress and Congressional staffers.

Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty (Educate and Engage)
The WSGC program pipeline is designed to attract students at an early stage in their STEM careers through initial opportunities with scholarships; to retain them with research fellowships; and to develop their interest in and viability for careers in aerospace through participation on one of our many team-based projects and programs. Finally, these students are then assisted in the procurement of in-state internships with our commercial partners and trained in the process of applying for NASA Center internships. The WSGC has been proactive about reaching out to UW-M students and faculty this year to partner with programs and students in an effort to leverage institutional strengths in the space sciences. We are implementing our pipeline model

by working with faculty to target students for continuous engagement and support over the course of their four-years in undergraduate STEM programs. This staged pipeline approach has helped us achieve a high retention rate in our programs with 11 students participating in more than one program this year and 9 students participating in programs during both FY 13 and FY 14. This year, we have worked to integrate the student opportunities with appropriate educator and faculty programs to leverage existing strengths at our affiliate institutions. An example of this effort is the provision of 8 student travel awards to support the UW-Milwaukee School of Engineering and their participation in the 2014-15 X-Hab Academic Innovation Challenge. UW-Milwaukee was one of five teams selected by NASA to participate in the X-Hab Challenge. They are investigating Fused-Deposition Modeling (FDM) for use with recycled materials in the design of spacecraft structures.

Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission (Engage and Inspire)

Our Aerospace Outreach Program specializes in partnerships, in which NASA-related curriculum is the inspiration for long-term STEM activities between schools and other institutions. This year, we funded the first "Space Camp" at Kickapoo Valley Reserve in upstate Wisconsin. The camp offered an astronomy curriculum in a hands-on, interdisciplinary context to children ages 8-10 in the 8500 acres of ridges, valleys, and creeks of the KVR. The innovative curriculum utilized new pedagogies for developing STEM literacy and astrophysical concepts such as an illustrating stellar recycling through fallen trees redistributing their carbon on the forest floor, and an environmental approach to teaching stellar life cycles using butterflies. These unique methods and the WSGC-sponsored program itself were recently featured on the PBS NOVA blog "A Science Program in Wisconsin Brings the Universe to Students' Backyards" http://www.pbs.org/wgbh/nova/blogs/education/2015/06/this-science-program-brings-the-universe-to-students-backyards/.

PROGRAM ACCOMPLISHMENTS

Per guidance received from NASA Education, the following accomplishments refer directly to Consortium goals and SMART objectives as defined in the FY14 proposal by the new lead institution. These are different than the goals and SMART objectives defined in the 2010 base proposal.

Outcome 1 associated goals and objectives

Goal 1

Objective A.1.1 accomplishments. The pool of applicants for WSGC scholarship and fellowships grew by 15% over FY 13. The growth can be attributed in part to a comprehensive approach to marketing and recruiting including WSGC staff visits to most academic affiliates during FY 14. As noted previously, WSGC has also seen an increase in program retention as measured by students persisting in WSGC programs from FY 13 to FY 14. This increase of five students over FY 12 to FY 13 persistence is likely driven in part by enhanced marketing and recruitment around our goals of building a pipeline and our ability to deliver progressive experiences that culminate in career opportunities in the space sciences. In our graduate programs, we have modified the WSGC Dr. Laurel Salton Clark Graduate Fellowship to welcome applications from

professional students engaged in physiology research with a space focus, thereby opening up the awards to our Affiliate students at the Medical College of Wisconsin. *Objective met.*

Objective A.1.2 accomplishments. In FY 14, we welcomed two new two-year colleges to our Affiliate network, and added two new Collegiate Rocket Launch teams from two-year affiliates. We funded 3 students from two-year affiliates in our programs this year. *Objective partially met.*

Objective A.1.3 accomplishments. The WSGC now has in place persistence and retention tracking measures that allow us to examine trends in the retention of students within our programs over a two-year period. *Objective met.*

Objective A.2.1 accomplishments. We have worked with ORBITEC, Inc. to streamline and clarify the goals and processes around our popular commercial internship program. We have also developed a new partnership with Gulfstream, Inc. who will apply for commercial Affiliate member status during FY 15. Three commercial internships awarded for FY 14. *Objective met.*

Objective A.2.2 accomplishments. Our Tethered Aerostat Program, funded by the Community College STEM Persistence augmentation grant, allows us to lay the foundation for developing a formal pipeline to connect two-year students with career opportunities in STEM through the development of skills and capabilities relevant to our state's aerospace industry. Relationships developed during FY 14 with Gulfstream are directed at supporting this Objective. Further, Lt. Governor, Rebecca Kleefisch, who chairs the manufacturing subcommittee for the Aerospace States Association, is working with the WSGC on connecting our programs and capabilities with state needs and opportunities. *Objective met.*

Objective A.3.1 accomplishments. In FY 14 our base grant funded 2 NASA Academy or Center interns and two NASA Center intern travel awards. One student eventually declined an award. This year, at our annual conference, we have dedicated a workshop for introducing students to NASA internship opportunities and have developed materials designed to teach students how to navigate the application process. We have invited an expert in preparing students for competitive applications (Goldwater, NSF, and Fulbright) to lead this workshop and have marketed it to all of our undergraduate and graduate award winners. *Objective partially met (one student declined an internship offer late in the cycle).*

Objective A.4.1 accomplishments. An internal review of program allocations suggests that we are devoting a disproportionate amount of resources to two programs and we have begun a Consortium-wide conversation on the balance of our allocations to determine if the programmatic outcomes of these investments support continued allocations at current levels. It is our strategic intent to use external and augmentation funding to support high-impact, high-cost activities such as residential summer programs in balloon payload design and deployment and rocket launches. *Progress toward Objective.*

Objective A.4.2 accomplishments. This objective seeks to increase the diversity of students participating in our high-impact team-based programs. While overall diversity metrics have improved in FY 14, we have not demonstrated appreciable growth in the diversity of our team-based programs. As these are some of the most transformative experiences we offer our students, there is much work to do on this front to ensure that the diversity of our rocket and balloon teams matches the rest of our programs. *Objective not met. Work continues.*

Objective A.5.1 accomplishments. The applicant pool for our Higher Education Incentives program grew by 2 applicants over FY13. The program now funds at least one annual award for adopting research-based STEM pedagogies with a focus on sustaining innovation. This year's HEI program focused on funding programs that clearly demonstrated a multi-year commitment to sustaining program impact. For example, FY 14 HEI program funded a "Drone Academy"

project that partners software developers with flight hardware students to offer an extensible UAV platform to science students in service of earth monitoring and photogrammetry needs. The student teams are selected specifically to replicate the breadth of skills in modern professional project teams, and to infuse the structured peer-mentoring ethos so critical to sustainable programs. *Objective met.*

Objective A.6.1 accomplishments. During FY 14, the WSGC funded two collaborative projects involving NASA personnel and undergraduate students and faculty. One project involved an early-career faculty member (Dr. Tav Hawkins, UW- LaCrosse). *Objective met.*

Objective A.6.2 accomplishments. Two-year faculty members are now eligible to seek Research Infrastructure funding. Formal relationships between UW Fox Valley (a two-year Affiliate) and UW Platteville Engineering have been leveraged to involve two-year students in long-term faculty-led research programs. UW Stevens Point now serves as a host institution for our two-year payload workshops in support of our Tethered Aerostat Program. *Objective met.*

Objective A.6.3 accomplishments. This year, three new projects with significant NASA Center involvement were funded by the WSGC. These include the UW-M X-Hab team, the Carthage College Flight Opportunities Program/USIP teamwork with KSC Cryogenics laboratory, and Milwaukee School of Engineering Senior Design project work with KSC Mentor Greg Galloway on mitigating thermal contamination of cold moons with robotic probes. *Objective met.*

Outcome 2 associated goals and objectives

Goal 2

Objective B.1.1 accomplishments. We funded 7 awards in Aerospace Outreach, directed at K-12 teacher training initiatives, planetarium curriculum, and NASA flight opportunities through the HUNCH program. One of our HUNCH teams, mentored by Matt Heer, was recently featured on NASA TV. The WSGC also sponsored the Wisconsin Regional ROV Competition Sunday, April 9, 2015. The event featured dozens of high school and middle school underwater robotics teams competing in a daylong program to qualify for an international underwater robotics competition in Norway. The WSGC Director was the keynote speaker at the event and highlighted the design challenges in common between underwater ROV projects and robotic space exploration. *Objective met.*

Outcome 3 associated goals and objectives

Goal 3

Objective C.1.1 accomplishments. Our Special Initiatives program provides planning grants and supplemental grants projects intended to encourage, attract, or retain underrepresented groups in STEM fields. During FY 14, we funded 6 such projects through the SI program, an increase of one project over FY 2013. *Objective met.*

Objective C.1.2 accomplishments. In service of this objective, we have appointed a new Aerospace Outreach program Associate Director who also serves as the Chair of the Wisconsin ACE (Aviation Careers Education) program, which offers summer programming to 35 minority-identifying Milwaukee Public School children each year. The program has been in existence for 24 years and is highly successful. Further, in FY 13, the WSGC began supporting aerospace education through the NASA HUNCH program, and in FY 14 we now have two faculty members involved in mentoring HUNCH teams at two high schools. *Objective met.*

Objective C.1.3 accomplishments. This is a long-term goal that has not been met this year within the 13 projects funded across the Aerospace Outreach and Special Initiatives programs. A single

student identifying as disabled was funded through our undergraduate scholarship program. The Program Office is developing new approaches to reach and to support this target audience. *Objective not met. Work continues.*

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

Diversity: The WSGC now has five two-year Affiliates, one all-female four-year Affiliate (Alverno College, the only all-female college in the state), and one of the state's two tribal colleges is an Affiliate member. Each institution is an active member in the Consortium, with one (Alverno College) recently hosting our annual spring meeting. This year, WSGC began working with our Alverno College Institutional Representative to identify ways the Consortium might better engage Alverno students. We will be implementing the recommendations in FY 15 through targeted recruitment of students at Alverno. This year, the WSGC reported 40.6% significant female participation and 14.6% total underrepresented student participation (target: 13.2%). We have achieved modest growth toward our goal of broadening our reach to underrepresented communities but much work remains to be done. Through our growing network of two-year and technical colleges, we are beginning to reach out to STEM students identifying as disabled in an effort to learn how best to serve their career aspirations. We are currently funding one such student through both our Undergraduate Scholarship and Tethered Aerostat programs. We have also reached out to military service veterans at our tribal college affiliate, and two such students are involved in our First Nations Launch competition and in our Tethered Aerostat program.

Minority-Serving Institution Collaborations: Wisconsin has two tribal colleges and one primarily female college. Of these three institutions, two are members of the WSGC: Alverno College and the College of Menominee Nation (CMN). Both are active members. Paul Smith, a professor at Alverno College, is a key mentor in our Collegiate Rocket program. This year, Dr. Smith also served as a judge in our rocket competitions and hosted our spring meeting. Our interaction with CMN is through the First Nations Launch activities which includes hosting the associated workshops, and through the Tethered Aerostat program in which CMN is one of the three participating teams. We have hosted three payload development workshops with the Tethered Aerostat program participants in which CMN students developed a project to monitor the health of local tribal forests using balloon-based multispectral imaging. CMN is working with the WSGC to promote their project with national tribal governmental organizations.

NASA Education Priorities: Our focus this year was on the NASA Education Priorities of authentic experiences, diversity, community colleges and Environmental Science and Global Climate Change.

• ***Authentic, hands-on student experiences:*** To meet this priority, nearly *every student* funded directly by the WSGC (except for some of our scholars where funds are meant to pay tuition) is required to be engaged in an active, authentic, hands-on, problem-solving experience. This includes all students funded through our Undergraduate Research and Graduate Fellowship programs; all NASA Academy, Intern and special programs students; all Industry Interns; all students funded by faculty under our Research Infrastructure program, and all Student Satellite Initiative team members and interns.

• ***Community Colleges:*** The WSGC has five members that are two-year or technical colleges (18% of academic members). All WSGC members are equal members of the Consortium and have an equal representation on our Advisory Council. The First Nations Launch competition provides a first exposure for students at tribal colleges and AISES chapters across the nation to design and launch a high-powered rocket in the context of a large, exciting annual event with NASA engineers and personnel in attendance. For FY 14, we supported 19 teams from 13 schools in this endeavor. This year, we were able to recruit 6 new schools to the competition. We also engage our two-year affiliates in the state-wide Tethered Aerostat program which we fund through the two-year STEM Persistence grant. This program supports three lead student interns and six affiliate student interns at each of three two-year schools. The TA program introduces payload design concepts and mentors students in the NASA design review process. Additionally, this year, one of our two-year affiliates (UW-Washington County) participated in our Collegiate Rocket Launch program.

• ***Environmental Science and Global Climate Change:*** The Tethered Aerostat program discussed above has a specific focus on using aerial imaging and sensing to address local and regional environmental monitoring concerns. Student teams proposed experiments and programs within this context and three projects were selected for funding through the TA Program. These projects included the tribal forest-monitoring project discussed previously, a project to assess air quality near the paper mills in the Fox Valley region of Wisconsin, and a power beaming experiment to assess the efficacy of space-based power transmission in the microwave Ka-band.

IMPROVEMENTS MADE IN THE PAST YEAR

In FY 2014, the WSGC undertook a change in Lead Institution and Director. With these changes came an entirely new Program Office. The concomitant changes in management structure and program delivery are many. The following are the most significant changes.

A new website and online application database were designed and implemented in FY 2014. This was not an update, but rather a complete rewrite of the dated WSGC website. The new site provides back-end content management interface for rapid display of Consortium news, permission-based portal access for documents and materials supporting the Advisory Council, comprehensive web analytics to assess the utility of our site to students and faculty, and integration with our new social media efforts. All program applicants now register on the site and find on-line application materials there. Our membership has expressed enthusiasm for the new design and focus of our site and Program Office staff have been trained on its use. The site can be seen here: https://spacegrant.carthage.edu.

We established a social media campaign on Twitter and Facebook to reduce our reliance on printed posters for announcements of opportunities. All grant deadlines and reminders are posted on both Twitter and Facebook and users are directed to the website for application information and log-in.

We moved our Proceedings Journal to an online platform using the PKP Open journal System hosting software. The journal was rebranded, given an ISSN number, and we now assign DOI numbers to all published articles. The journal is now the most visited page set in the WSGC web. The manuscript preparation and submission process was changed to support this new journal. WSGC journal articles now show up in citation indexes. The journal is open access and can be viewed here: https://spacegrant.carthage.edu/ojs/index.php/wsc.

During FY 14, we solicited the input of our Advisory Council and received approval to modify the schedule of awards and announcements of opportunities to better distribute the awards throughout the academic year. These changes have been implemented for FY 15 and will allow us to better align our offerings with our affiliates, balance the workload across the year in the Program Office, and normalize our draw from the NSSC.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Wisconsin Space Grant Consortium Members

All WSGC Affiliate members have equal status and equal representation on our Advisory Board regardless of their size. All WSGC programs are openly competed within the Consortium and no programs are "housed" at individual campuses. As noted below, some institutions serve different recurring roles within the Consortium, but all Affiliates contribute Advisory Council representation to the WSGC.

- Alverno College, Academic 4yr bac; *Served as host of 2015 annual spring meeting; provide support services for Collegiate Rocket Launch activities.*
- Carroll University, Academic 4yr bac; *participates in S/F.*
- Concordia University- Wisconsin, Academic 4yr bac; *participates in S/F.*
- Lawrence University, Academic 4yr bac; *participates in S/F.*
- Ripon College, Academic 4yr bac; *Served as host of 2014 annual spring meeting; participates actively in Collegiate Rocket Launch competition.*
- St Norbert College, Academic 4yr bac; *participates in S/F, Collegiate Rocket Launch.*
- University of Wisconsin-Oshkosh, Academic 4yr bac; *participates in S/F, assists with planning and housing support for 2015 WSGC annual conference.*
- University of Wisconsin-River Falls, Academic 4yr bac; *participates in S/F.*
- Wisconsin Lutheran College, Academic 4yr bac; *participates in S/F.*
- Carthage College, Academic 4yr bac/Grad; *Lead Institution; participates in S/F, regular user of WIYN Consortium opportunities; hosts microgravity, RockSat teams.*
- University of Wisconsin-Green Bay, Academic 4yr bac/Grad: *Former Lead Institution.*
- University of Wisconsin-La Crosse, Academic 4yr bac/Grad; *participates in S/F. Provides Associate Director for Undergraduate Research and Research Infrastructure programs; Served as host of 2011 annual summer conference.*
- University of Wisconsin-Parkside, Academic 4yr bac/Grad; *participates in S/F.*
- University of Wisconsin-Platteville, Academic 4yr bac/Grad; *participates in S/F.*
- University of Wisconsin-Stevens Point, Academic 4yr bac/Grad; *Provides workshop facilities and logistical support for Tethered Aerostat program.*
- University of Wisconsin-Stout, Academic 4yr bac/Grad; *participates in S/F.*
- University of Wisconsin-Superior, Academic 4yr bac/Grad; *host of 2009 annual summer conference.*
- University of Wisconsin-Whitewater, Academic 4yr bac/Grad; *host of 2012 annual summer conference.*
- Milwaukee School of Engineering, Academic, Bac/Grad; h*ome of the Student Satellite programs in high altitude ballooning and Collegiate Rocket Launch activities; Provides Associate Director for Student Satellite Initiatives.*
- College of the Menominee Nation, Academic Tribal; *participates in Tethered Aerostat, First Nations Launch programs.*

- University of Wisconsin-Fox Valley, Academic Com/Jr; *participates in Tethered Aerostat program.*
- University of Wisconsin-Sheboygan, Academic Com/Jr; *served as host of 2010 annual summer conference.*
- University of Wisconsin-Washington County. Academic Com/Jr; *new affiliate member; supported collegiate rocket launch team in 2014-15.*
- Western Technical College, Academic Com/Jr; *Institutional Representative serves as Chair of Advisory Council; participates in Tethered Aerostat program.*
- Marquette University, Academic PhD; *Served as host of 2013 annual summer conference; provides Associate Director for Higher Education Initiatives program.*
- University of Wisconsin-Madison, Academic PhD; *provides Associate Director for Special Initiatives.*
- University of Wisconsin-Milwaukee, Academic PhD; *provides Associate Director for Scholarships and Fellowships.*
- Medical College of Wisconsin, Academic Medical; *participates in S/F.*
- Aerogel Technologies, LLC, Industry Aerospace.
- Astronautics Corporation of America, Industry Aerospace.
- Orbital Technologies Corporation, Industry Aerospace; p*rovides Associate Director for Industry Programs.*
- Space Explorers, Inc., Industry K-12 Ed.; *participates in internships.*
- Spaceflight Fundamentals, LLC, Industry Informal Ed.; *participates in app. reviews.*
- Crossroads at Big Creek, Not-for-Profit Informal Ed; *participates in app. reviews.*
- Experimental Aircraft Association (EAA), Not-for-Profit Aviation Ed.; *serves as host of 2015 annual summer conference.*
- AIAA – Wisconsin Section, Not-for-Profit Student Eng.; *provides judges, logistical support for student rocket competitions.*
- BioPharmaceutical Technology Center Institute, Not-for-Profit Informal Ed. *served as host of 2014 annual summer conference; participates in app. reviews.*
- Great Lakes Spaceport Education Foundation, Inc., Not-for-Profit K-12 Ed.; *participates in Collegiate Rocket Launch program.*
- Spaceport Sheboygan, Not-for-profit Space Ed.; *hosts meetings and provides judges and logistical support for collegiate rocket launch programs.*
- Kickapoo Valley Reserve, Government State; *runs Space Camp program featured in PBS/NOVA blog.*
- Wisconsin Aerospace Authority, Government State.
- Wisconsin Department of Public Instruction, Government State.
- Wisconsin Department of Transportation, Government State; *Provides Associate Director for Aerospace Outreach; provides judges and logistical support for many activities including collegiate rocket launch programs.*